

Laser Use Registration *Application* (L.U.R.)

Instructions:

- Please complete a separate LUR application for each laser >5 mW (Class 3b or Class 4 laser).
- Forward the completed application to the Laser Safety Officer (Linda Vadura) c/o of the COSE Dean's Office.
- Do not operate your new laser until the Non-Ionizing Radiation Committee (NIRC) has reviewed and approved your application.

Part I Registration Details

A. Contact Information

Name of Responsible Person(s):

(Principal Investigator/Lab Supervisor)-Primary

Name of Responsible Person(s):

Secondary Contact (if any)

Dept:

Telephone:

Email:

B. Background Information

Laser will be in which building?
 Thornton Hall Hensill Hall Science Bldg

Room #

What is the primary use of the laser?
 Teaching Research

Briefly describe how the laser will be used: _____

C. Laser Information

Make & Model

Serial No.

Laser Classification

Class IIIb 5mW-500 mW (< 125mJ pulsed)

Class IV > 500 mW

Beam Diameter at Aperture
 mm

Beam Divergence
 mrad

nm

nm

Continuous Wave

Maximum
 W

Average

OR

Pulsed Wave

Maximum Pulse Frequency
 nsec Hz

Average

Please check all items that apply to your operation:

- | | | | |
|----------------------------------------------|------------------------------------------------|-----------------------------------------------------|------------------------------------------------|
| <input type="checkbox"/> Invisible Beam | <input type="checkbox"/> Exposed Beam Path | <input type="checkbox"/> Frequency-doubling Crystal | <input type="checkbox"/> Tunable Laser |
| <input type="checkbox"/> High Voltage (660V) | <input type="checkbox"/> Beam Focusing Optics | <input type="checkbox"/> Cryogenic Liquids | <input type="checkbox"/> Dye Laser |
| <input type="checkbox"/> Laser Modification | <input type="checkbox"/> Laser Cutting/Welding | <input type="checkbox"/> Compressed Gases | <input type="checkbox"/> SFSU Fabricated Laser |

For Office Use Only

Received by LSO on _____
Date

Approved by NIRC on _____
Date

Part II –Hazard Assessment and Safe Practices

A. Security and Access Controls

Goal: Preventing unauthorized or accidental access to the laser system.

1. Describe the engineering or administrative controls you will have in place to prevent skin or eye contact with the laser beam(s) during adjustment or maintenance.

2. How will you prevent unauthorized users from entering the control area? How will you protect visitors, custodians or other "civilians" when the laser is operating?

GOAL: Preventing the laser beam from making contact with a person's eye, skin or clothing

1. Describe your interlocks or other engineering controls. If none, explain your alternative method.

B. Personal Protective Equipment

When will you require laser users to wear eye protection?

While using the laser? NO YES

During alignment? NO YES

During maintenance? NO YES

What wavelength(s) are you protecting against?

785

What is the expected duration of exposure?

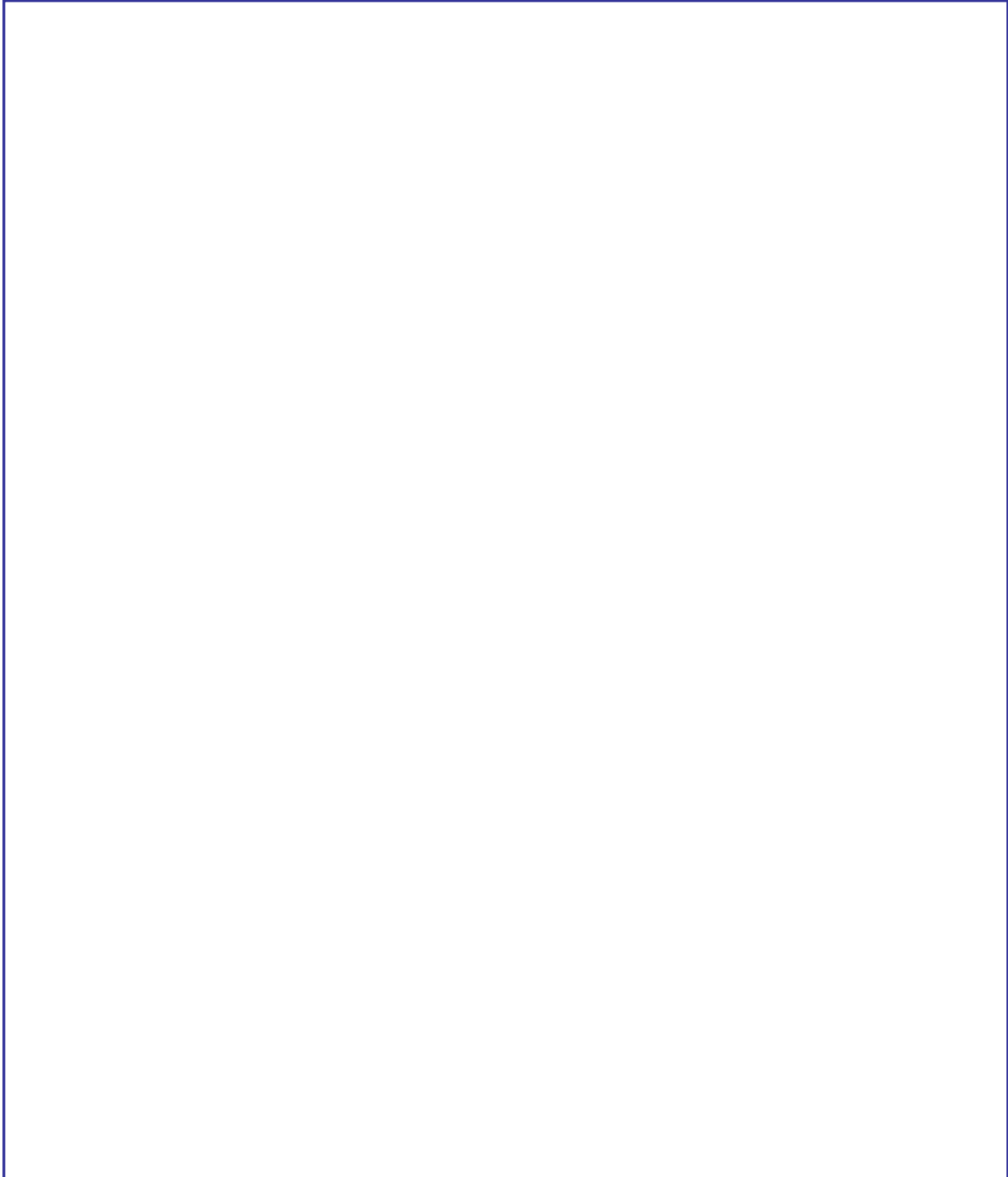
Brand and Model of Eyewear

Rated wavelengths:

If no eye protection will be required, please explain. _____

Diagram of Laser/Laser System Setup

Show location of beam stops, interlocks, shielding, mirrors and other relevant details or attach drawing.



V Administrative

A. Safe Operating Procedures (SOP)

1. Please attach a written procedure for each of the following tasks:

- Maintenance or Adjustment (include lockout instructions)
- Laser startup/shutdown

Other: _____
(Optional)

Once you have assessed the hazards in your operation, you must go on to the next step: writing operating procedures that all laser users under your supervision must follow. Review the General Laser Operating Guidelines in the Laser Safety Manual

When writing your procedures, please take into consideration the hazard assessment and protective measures and common laser lab hazards reviewed in this section. For more guidance, the General Laser Operating Guidelines, in the Laser Safety Manual, offer a good description of the basics involved in using lasers.

B. Administrative Checklist

- Copy of completed Laser Safety Plan and LUR package
- Laser system labeled with class, wavelength and hazard information
- Appropriate warning signs (per ANSI Z136.1-2000) posted
- Written alignment, start up and shut down procedures posted
- List of authorized laser users for current year is posted
- Laser users have received their basic laser safety orientation and baseline laser eye exams
- Eye protection for wavelength(s) of laser available
- Training documentation on file for laser users in lab-specific practices

Signature of Principal Investigator or Lab Manager

Date Submitted to LS0

Signature of 2nd Principal Investigator or Lab Manager

Date Submitted to LS0

For Official NIRC Use Only

LUR APPROVED as submitted

LUR NOT APPROVED as submitted

Comments: _____

Signature of Laser Safety Officer

Date

Appendix: Hazard Assessment Guide

-OSHA's required Illness and Injury Prevention Program. Performing a hazard assessment to identify work hazards is essential to creating a safe work area. Before you can minimize risks, you need to know what the risks are. The chart below summarizes hazards and protective measures common to laser operations.

1. Example of a hazard assessment

Common Laser Beam Hazards	Indirect Laser Hazards	Protective measures that minimize risk of injury
<p>Beam crossing a pathway</p> <ul style="list-style-type: none"> ▪ <i>Damaged or burned clothing</i> ▪ <i>Burned or damaged skin or eyes</i> ▪ <i>Escaping beam causing combustible materials to burn – fire hazard</i> ▪ <i>Damage to walls and equipment</i> ▪ <i>flash blindness</i> ▪ <i>temporary vision loss</i> ▪ <i>damaged cornea</i> ▪ <i>burned retina</i> 	<ul style="list-style-type: none"> ▪ Jewelry ▪ Mirrors ▪ Shiny metal objects <p>Toxic or pressurized chemicals</p> <ul style="list-style-type: none"> ▪ Off-gassing of dyes and chemicals ▪ Hazardous chemical exposure ▪ Compressed gases ▪ Cryogenic fluids ▪ Explosion of high pressure lamps <p>Electrical</p> <ul style="list-style-type: none"> ▪ High voltage ▪ Electric shocks ▪ Electrical fires 	<ul style="list-style-type: none"> ▪ Securing beam stops ▪ Shielding to contain stray beams ▪ Using low power alignment lasers ▪ Restricting access ▪ Wearing eye protection ▪ Warning signs clearly posted ▪ Mapping the beam path(s) ▪ Removing jewelry ▪ Using interlocks ▪ Training ▪ Locking out during maintenance ▪ Using lowest practical power ▪ Consistently enforcing safe practices

2. Note commonly observed unsafe practices that cause preventable laser accidents:

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-
-
-
-
-

3. Example of an SOP for alignment with included hazard assessment

related accidents. According to the LSO at Lawrence Berkeley National Laboratory, 60% of laser accidents in research settings occur during the alignment process.

Alignment

Potential Hazards	Protective Measures	SAMPLE: Alignment Procedures
<ol style="list-style-type: none"> 1. Beam hitting an eye 2. Beam hitting flammable or combustible materials 3. Injury to visitors 4. Beam escaping confines of the optics table 	<ul style="list-style-type: none"> ▪ Isolate the area during alignment ▪ Choose the correct eye wear ▪ Wear the provided eye wear ▪ Mark the back side of each beam stop ▪ Double-check beam stop locations ▪ Use the lowest practical power setting ▪ Take off jewelry ▪ Set beam paths below eye level of people working in the area ▪ Clearly mark any beam directed out of a horizontal plane ▪ Don't allow unauthorized or unnecessary people in the room during alignments 	<ol style="list-style-type: none"> 1. Put up a shielding curtain. 2. Make sure warning sign "<i>Keep Out. Alignment in progress</i>" UVEX laser goggles. 4. Check beam stop locations and secure them. 5. Power up the system. 6. Take the He-Ne alignment laser and align the beam as required. 7. Identify and terminate each and every stray beam coming from any optical component moved. 8. Make sure beam paths are at a safe working height below the eye level of the user(s) before you leave.